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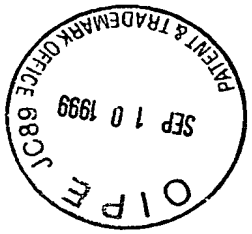
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Tommy Petrogiannis



Serial No.: 09/369,734 Group Art Unit: 2766

Filed: August 6, 1999 Examiner:

For: METHOD FOR PARALLEL APPROVAL OF AN ELECTRONIC DOCUMENT

Attorney Docket No.: 9740-006

SUBMISSION OF PRIORITY DOCUMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

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Sir:

In connection with the above-identified application, Applicant has claimed the priority, under 35 U.S.C. §119, of Canadian Patent Application No. 2,242,130, filed August 7, 1998. In support of this claim, a certified copy of the priority application is submitted herewith.

No fee is believed to be due for this submission. Should any fees be required, however, please charge such fees to Deposit Account No. 16-1150.

Respectfully submitted,

Kenneth L. Stein (Reg. No. 38,704) for

Date September 10, 1999

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Enclosure

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La présente atteste que les documents ci-joints, dont la liste figure ci-dessous, sont des copies authentiques des documents déposés au Bureau des brevets.

This is to certify that the documents attached hereto and identified below are true copies of the documents on file in the Patent Office.

Specification and Drawings, as originally filed, with Application for Patent Serial No: **2,242,130**, on August 7, 1998, by **SILANIS TECHNOLOGY INC.**, assignee of Tommy Petrogiannis and Joseph Silvester for "Method For Parallel Approval Of Documents In A Distributed Network".

S. Gregoire

Agent certificateur / Certifying Officer

August 18, 1999

Date

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METHOD FOR PARALLEL APPROVAL OF DOCUMENTS IN A DISTRIBUTED NETWORK

Background:

Currently, documents are being created, revised and approved electronically. With the advent of networks and Internet, more and more documents need to be approved simultaneously and in parallel. Presently, the documents that require multiple approvals are approved in serial fashion, through the use of workflow or E-mail. There are no known parallel approval systems in existence. The existing approval systems rely on users approving the documents in a serial fashion.

Summary of the invention:

The present invention enables users to approve documents in parallel. This increases the efficiency and reduces the delays incurred in the document approval process.

This document describes how parallel approval can be achieved on Electronic Documents. In order for the Approvals to be valid and accurate, various issues need to be addressed:

1. The document submission for Approval and creating an original DAC to make sure everyone is approving the same document.

2. An alternate method of parallel approval without generating the original DAC.

3. A method of incorporating the parallel approval information into the original Electronic Document and still maintain the approval and document integrity.

4. A method of Approving sections or portions of the document by multiple approvers. Again incorporating all the approval information back into the original document.

5. A method of multiple people approving multiple files and then incorporating each approval into a single compound approved document.

In summary, the invention consists of creating a document to be approved or authorized and sending the document to be approved to at least two separate authorizers who independently approve the document. Means are provided to ensure document integrity throughout the approval process, so that the document to be authorized is the original document to be approved.

There are a few steps in describing the parallel approval process. Please refer to **Figures 1, 2, 3 and 4** for the following discussion.

Submitting the Electronic Document for Approval

The first step in submitting an electronic document for approval is to create a DAC (document authentification code) on this document. In figure 1, this DAC has been termed DAC (0). This DAC (0) can be stored inside the document or made available to the approvers through a linked storage system. The Electronic document and DAC (0) are then distributed using the Distribution System.

Parallel Approval

Each person approving the document can approve the document independently. Each Approval will generate a DAC on the document being approved, along with additional approval information such as date, signers name, signature, picture, finger print, seal or other data or a combination thereof required for the approval process.

This information can be stored in an Encrypted Approval Data Packet (EADP). The original Electronic Document DAC (0) and the DAC in the EADP must be the same for the approval to be valid. Otherwise, the person is approving a document that has changed and the approval will not be permitted. The original document with all the associated EADPs will complete the approval. As long as the EADP and the original documents are maintained, the approvals will be complete.

Note: The reason DAC (0) is compared with the DAC generated by the Approver is to ensure that everyone approving the document is approving the same information. Otherwise, there will be a situation where different people have approved different information. An alternative way to achieving the same result without generating DAC (0) is to permit approvers to approve the electronic document, and upon completion of all the approvals, the merge system will verify if all the DACs in all the EADPs are the same. If there are differences, then proper corrective action needs to be taken. The case where approvers are allowed to change data that is being approved is addressed in the sectional approval section.

Handling the EADPs after the Parallel Approvals

At this point there are various options in dealing with the EADPs that are generated during the approval process. These EADPs can be stored in a linked storage system or sent to a merge system for incorporating the EADPs into the original Electronic Document.

Merging of EADPs into the Original Electronic Document (Optional Step)

Please refer to Figure 2 for the flow chart. Once all the approvals have been completed, the EADPs can be processed to incorporate the actual approval information back into the original document. After the approvals have been completed the separate approval EADPs are examined and then incorporated into the original electronic document. (Note: this step is an optional step but in most business process a preferred one). This process involves modifying the DAC of the original document with each approval that is incorporated. The DAC of the original document needs to be modified due to the fact the new approval data is being

incorporated will change the document. Therefore, the DAC needs to be modified with each Approval, adding the audit trail information from the EADP and inserting into the Electronic Document EADP. Again only valid approvals can be incorporated into the original Electronic Document. The incorporation can be done real time as each approval is taking place, or can be done off-line in a serial or batch mode or any variation of the above mentioned methods.

Dynamic Data Manifestations (Optional Step)

Optionally, in inserting the approval information into the document that was approved, Dynamic Data Manifestation with the approval could be utilized. This method will allow user data from EADP to be inserted into pre-targeted viewable locations. The viewable location implies in the actual document i.e. in most business forms there is signature location, with an area for signers name, title and date. The Dynamic Data Manifestation method will allow actual data to be inserted into these locations without invalidating the DAC. This is accomplished by verifying the DAC before the Dynamic Data Manifestations are used. Then if the Electronic Document verifies, the new data is inserted to pre-targeted locations and then the DAC is recalculated to account for the new data.

Data is entered into the document in a secure fashion so as to not corrupt the approval process or the previous approvals.

Sectional or Partial Approval (Optional Step)

Optionally, the parallel approval can be configured in such a way as to allow users to approve parts of the electronic documents. Please refer to Figure 3 for the flow chart. This would entail using a variable DACs for various sections of the electronic documents. In this case, the word section could mean a particular section of a document or in a multi-file document it could mean a particular file or particular

section in a file or multiple files or a combination of the above. The approval process would determine this definition. The process would work exactly as defined above, however, there would be multiple DACs defined relating to various sections that need to be approved. Referring to the attached flow chart, Fig. 3 it is possible to record various DACs generated for each section with each EADP. In approving sections a mechanism of determining which section user X will approve has to be setup. There are numerous ways this can be established. The original document could have user information embedded in it that would allow it to determine which sections are being approved by the User X. Another method is user indicates on the document which sections are to be included in the approval. This can be done using various methods such as selecting the various sections, or having a list of sections that indicates to systems which sections to use to generate the DAC. The DAC contained in the EADP will encompass the DAC generated based on these sections only. The selection indications depend on the data that is being approved and the various schemes available to identify them. For example, in an MS Word document the sections can be outlined using sections or bookmarks, etc. In multiple file situation, there might be a separate file that would define various sections, etc. Methods for defining the sections are varied and numerous. Once the EADPs have been generated, they can be processed as previously described.

Note: This method can be used in reverse. This is to implement a signing sheet type process. A single document can have multiple DACs that point to separate data. So each approver would be approving the same document however, the document would contain links to other data that are not part of the document. Also, alternatively, two persons may approve two sections of a single document, but where there is overlap between the two sections. For example, a person may approve a form on which data is present, and the other person may approve the form and also a section of the form where comments are inserted.

Single Approved Compound Document (SACD) from multiple approved files (Optional Step)

Optionally, this method allows for approving multiple separate documents and then having them merged into a single approved document. Please refer to figure 4 for the flowchart for this method. In this multiple approval scenario, the approvals are done on separate files by separate approvers. The approved documents are combined into a single approved compound document. Each approved document is verified, both data and EADPs are extracted and securely entered into the SACD. This step is important because both the data and the approval information are verified and then securely moved into another separate electronic document without invalidating the approval or altering the contents of the data. As will be described later on, in the SACD the DAC will be adjusted to reflect the new data that have been added. Once all the relevant files have been incorporated, the document can be archived or published.

We have only discussed the Approval portion. The verification of the document and secure printing are all standard practices that have been already invented. For example, approved documents can be verified using a verification method that will inform the users, if the document has been tampered with. The same functionality can be added to the printing function. If the verification fails on the document, the document cannot be printed with approval information such as signatures, seals or other approval indicators. Furthermore, other systems can be put in place to prevent the document from being used if the verification fails. This particular patent application is directed to a parallel approval process. These other portions exist and therefore are not discussed here.

Although the present invention has been explained hereinabove by way of a preferred embodiment thereof, it should be pointed out that any modifications to this preferred embodiment within the scope of the present description is not deemed to alter or change the nature and scope of the present invention.

Definitions:

Audit Trail: Is the information generated at the time of approval. This can include things such as date, time, comments, and location of approval and include any other data required by the approval process.

DAC: Document Authentification Code. This is a one way hash function or another method that uniquely describes the contents of an electronic document.

Distribution System: Distribution system implies various methods of distributing data such as E-mail, networks, world wide web, transactions in a transaction processing system, messages or links, etc. Distribution system involves using any or all, or combination of systems.

Dynamic Data Manifestations: DDM is used to insert approval data into viewable regions of an electronic document. The key is to make sure the insertion of data does not invalidate the DAC and the data must be inserted into pre-targeted areas. The document is verified before DDM, if the document verifies then the data is inserted, then the DAC is recalculated to account for the new data. The system should enter the data securely to make sure no other alterations are done to the data other than the allowed changes.

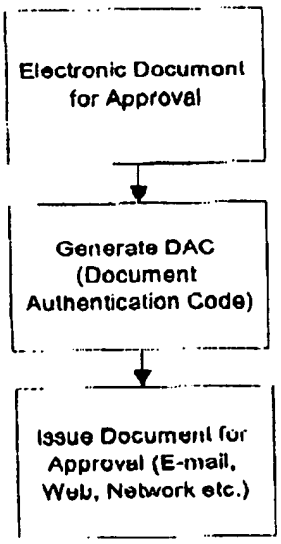
Electronic document: Electronic Document can represent electronic files composed of text, images, video, graphics, audio or any other data or a combination of any or all of the above. The Electronic document can also contain multiple files containing all or some of the above mentioned items. An Electronic Document may also be raw data that nees to be authorized prior to incorporations into a database.

EADP: Encrypted Approval Data Packet. This packet can contain various information such as DAC, Information specific to the approver such as signature, finger print, voice print, hand print, picture, seal, passwords, etc, audit trail information such as date, time, location, comments, and any other data pertinent to the approval as

required by the approval process. Note: not all of the components have to be present, any combination of the data can be used.

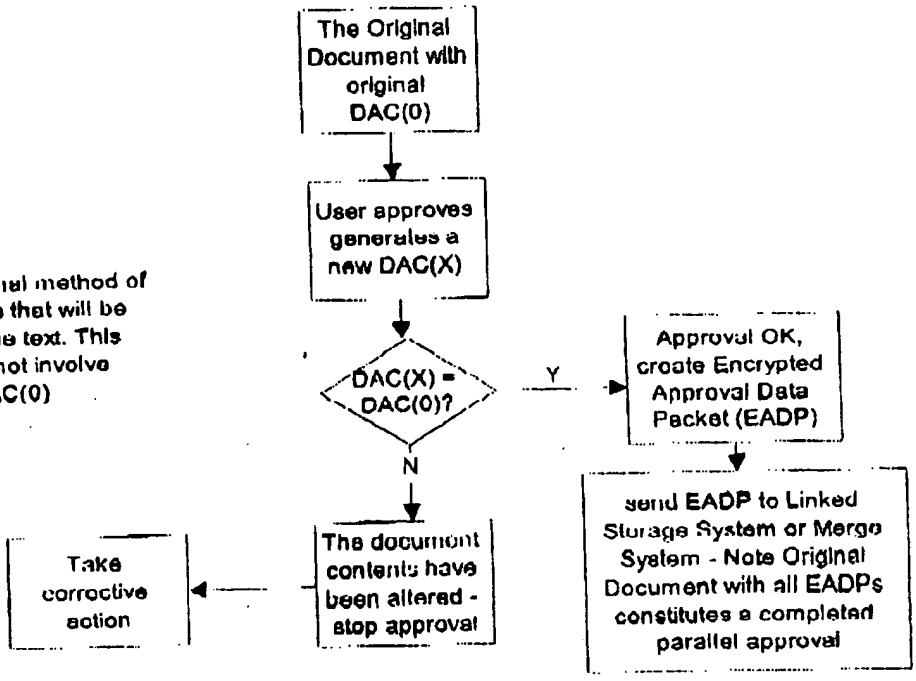
Linked Storage System: Is a system of storage that will follow for storing data that is linked to other data. This can be accomplished using databases, or storing related files in the same directory, or having objects that are linked or something simple as file describing which data are linked. Essentially, this system should allow for detecting data or files that are related.

1. Issue document for Approval



Electronic document can be distributed via e-mail, network or the Internet. Essentially access is given to this file and DAC for user approval. The DAC can be embedded into the file or made available to the approval program through a link (i.e., a unique file name and location) or in a database.

2 User Approvals in Parallel - each user will go through the same steps



Note: an optional method of approval exists that will be described in the text. This method does not involve generating DAC(0)

Figure 1

Incorporating seperate EADPs into the original Document

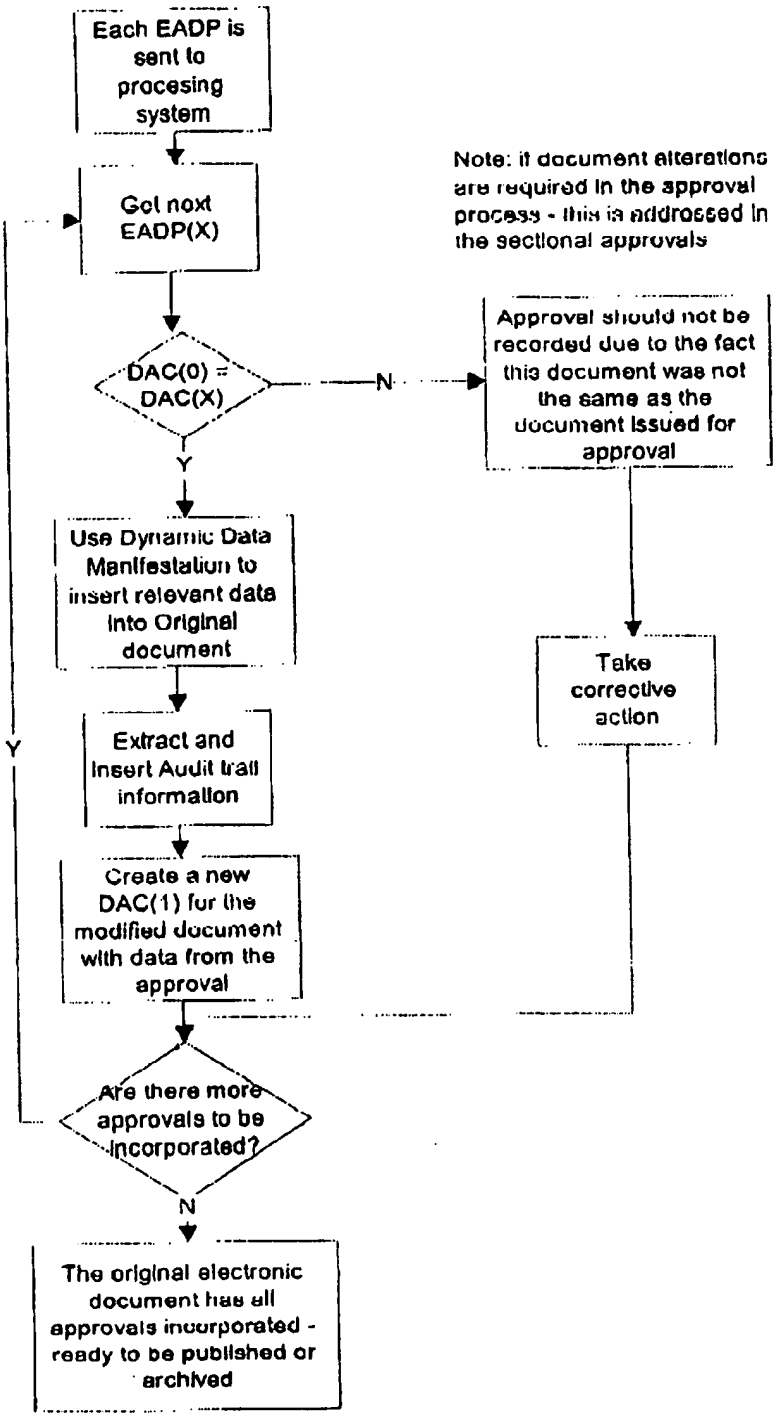


Figure 2

Sectional Approvals In Parallel Approval Process

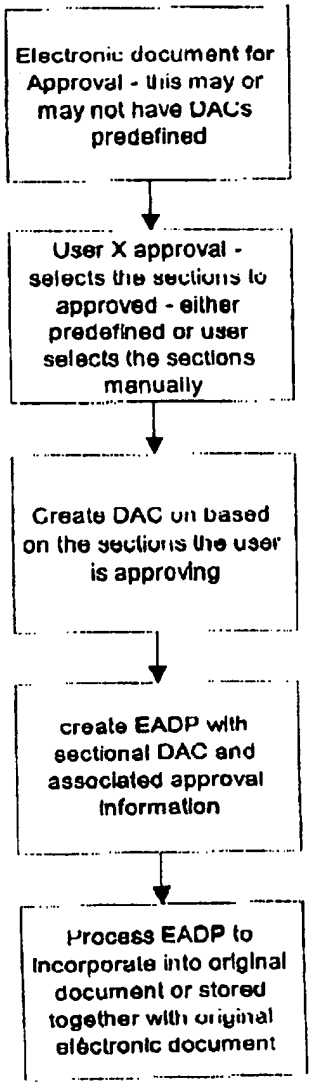
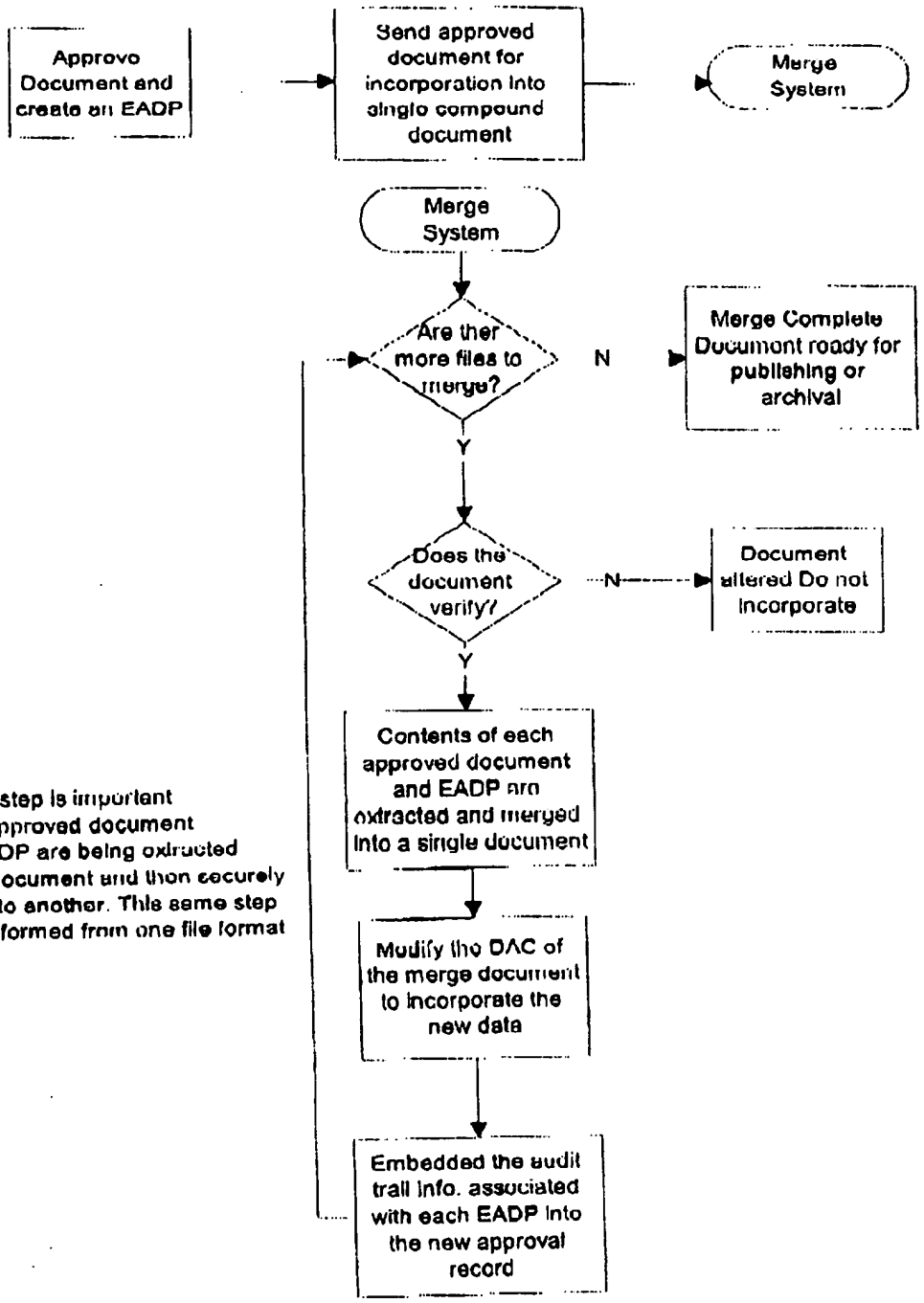


Figure 3

Mulitiple files Approved individually and then Incorporated Into a Single file with Multiple Approvals



Note: This step is important Here the approved document and theEADP are being extracted from one document and then securely inserted into another. This same step can be performed from one file format to another

Figure 4

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